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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/283,198 04/01/99 FIEDLER

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AIR MAIL

EXAMINER

SORKIN, D

ART UNIT

PAPER NUMBER

1723

DATE MAILED:

08/03/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/283,198

Applicant(s)

FIEDLER ET AL.

Examiner

David L. Sorkin

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2000.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 3-22 is/are pending in the application.
- 4a) Of the above claim(s) 3-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on 02 June 2000 is: a) ☐ approved b) ☒ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☒ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-12, drawn to and mixing apparatus, classified in class 366, subclass 150.1.
  - II. Claims 13-22, drawn to a mixing process, classified in class 366, subclass 108
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus could be used to mix fluid upstream of the divider means.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Eugene Gierczak on 02 June 2000 a provisional election was made without traverse to prosecute the invention of the method, claims 12-22. Affirmation of this election must be made by applicant in replying to this Office action. Claims 3-11 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Priority***

7. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on 03 April 1998. It is noted, however, that applicant has not filed a certified copy of the foreign application as required by 35 U.S.C. 119(b).

***Drawings***

8. The proposed substitute sheet of drawings, filed on 02 June 2000 has been disapproved because it does not completely replace an original drawing sheet. Only fig. 2 is on the new drawing sheet whereas figs. 1 and 2 were on the original sheet.

***Specification***

9. The substitute specification filed 02 June 2000 was not entered, because it contains new matter. Examples of new matter in the specification include statements that the invention is applicable to the automobile, combustion, petroleum, mining, naval,

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and measuring instruments industries; the discussion of U.S. Pat. Nos. 4,257,224 and 3,408,050; and the introduction of round, rectangular, square and triangle tube species. These are only examples what is considered new matter, and are not intended as a complete catalog of the new matter entered. It is the applicants' responsibility not to enter new matter. The abstract and the new claims were entered.

10. The original disclosure is objected to because of the following informalities: The section "5 Claims What is claimed is ... The process is characterized by" should be replaced by -- What is claimed is --. A -- Breif Description of Drawings -- heading should replace "An example of the mixing is displayed here". Also, spelling and grammar errors should be corrected.

Appropriate correction is required.

#### ***Claim Objections***

11. Claims 12-13 are objected to because of the following informalities. Appropriate correction is required.

12. Claims 12 and 13: In line 1, "the mixing" should read -- mixing --.

#### ***Claim Rejections - 35 USC § 112***

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 15-22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

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reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

15. Claims 15-17: The original specification does not enable a step of matching at least one chamber to said actuator. The original specification does not enable one to make and use an actuator which is a narrow frequency band independent on said fluid convection velocity, required by the process as claimed.

16. Claim 18: An enabling description of how to use the invention to reduce acoustic noise is not found in the original specification.

17. Claim 19: An enabling description of how to use the invention to improve chemical reactor instability is not found in the original specification.

18. Claim 20: An enabling description of how to use the invention to improve flow separation control is not found in the original specification.

19. Claim 21: No discussion of the of the ratios of claim 21 is found in the original specifiaction

20. Claim 22: An enabling description of how to use the invention to enhance heat transfer in heat exchangers is not found in the original specification.

21. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

22. Claims 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

23. Throughout the claims the use of the phases "at least one stream", "at least one chamber" and "at least one splitter plate" is unclear. For example, the phrase "at least one chamber" is recited four times in claim 12. The first instance "introducing ... into at least one chamber" is clear; however, the subsequent instances are unclear as to if, and if so, how, they relate to the first set of "at least one chamber". In each non-first recitation of the above phases it should be clear if (A) the recitation is open to the newly recited set being a different set of "at least one chamber"; (B) the recitation is referring to said set of "at least one chamber" but is open to any member of the set; or (C) the recitation is referring to said one chamber of said "at least one chamber".

24. Regarding claim 15, the meaning of "independent on said fluid convection velocity" is unclear. Should "on" read -- of --?

25. Regarding claims 18-22 the terms "reduces", "improves", "sufficiently high", and "enhances" are relative terms, the degree and scope of which can not be reasonable appraised by one skilled in the art.

26. Regarding claim 19, it is unclear what is meant by "chemical reactor instability"

27. Regarding claim 20, it is unclear what is meant by "flow separation control".

28. Regarding claim 21, it is unclear what is meant by "initial velocity ratios of  $(U1 - U2)/(U1 + U2)$  and  $(U1 + U2)/2$ ".

29. Regarding claim 22, there is lack of antecedent basis for "the heat transfer rate".

***Claim Rejections - 35 USC § 103***

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

31. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wygnanski et al. (US 4,257,224).

32. Claim 12: Wygnanski et al. ('224) discloses a process for mixing a fluid stream and creating streamwise vortices comprising introducing a fluid stream into a chamber having a proximal end and a distal end, through an inlet means for receiving a fluid stream at said proximal end of said chamber (see col. 3, lines 26-39; figs. 1 and 2); separating the fluid stream within the chamber by a divider means (3) mounted at said proximal end of the chamber (see fig. 1 and 2); applying a corresponding actuator (4) for forcing the mixing of the fluid streams downstream of the divider (see col. 3, lines 34-39). To the extent that Wygnanski et al. ('224) does not explicitly disclose a chamber in the embodiment of figs. 1-4, it is considered that it would have been obvious to one of ordinary skill in the art to have used a chamber, to confine the fluid streams. Wygnanski et al. ('224) discloses a chamber in the embodiment of fig. 8, which confines a fluid stream.

33. Claim 13: In the process of Wygnanski et al. ('224) discussed above with regard to claim 12, said divider means is a splitter plate (see col. 3, lines 34-35) having a trailing edge wherein at least one fluid stream mixes downstream of said trailing edge of at least one splitter plate creating streamwise vortices (see col. 3, lines 47-56; fig. 2).

34. Claim 14: In the process of Wygnanski et al. ('224) discussed above with regard to claim 13, at least one splitter plate (3) extends from said proximal end of at least one



chamber to a point toward said distal end of at least one chamber for separating at least one fluid stream until said trailing edge of at least one splitter plate and generating vortices for mixing at least one fluid stream (see col. 3, lines 26-56; figs. 1 and 2).

35. Claim 15: The process of Wygnanski et al. ('224) discussed above with regard to claim 14, further comprises matching at least one chamber to said corresponding actuator wherein said corresponding actuator is a narrow frequency band independent on said fluid convection velocity (see col. 3, lines 63-68 and col. 4, lines 1-40).

36. Claim 16: In the process of Wygnanski et al. ('224) discussed above with regard to claim 15, the narrow frequency band is generated by a means of a forced flap (4) in the trailing edge of a splitter plate (3).

37. Claim 17: The process of Wygnanski et al. ('224) discussed above with regard to claim 16, producing a periodic velocity component generated from said corresponding actuator (col. 2, lines 21-25).

38. Claim 18: The process of Wygnanski et al. ('224) discussed above with regard to claim 12, reduces acoustic noise (col. 1, lines 10-15; col. 8, lines 1-5).

39. Claim 19: The process of Wygnanski et al. ('224) discussed above with regard to claim 12, improves chemical reactor instability (see col. 2, lines 2-6; col. 7, lines 20-35).

40. Claim 20: The process of Wygnanski et al. ('224) discussed above with regard to claim 12, improves flow separation control (see col. 3, lines 34-35).

41. Claim 21: In the process of Wygnanski et al. ('224) discussed above with regard to claim 12, at least one fluid stream has sufficiently high initial velocity ratios for no external forcing (see col. 7, lines 52-54).

42. Claim 22: The process of Wygnanski et al. ('224) is discussed above with regard to claim 12. Wygnanski et al. ('224) does not disclose using his invention in a heat exchanger. However it is considered that claim 22 does not positively recite a step of transferring heat. Furthermore, it is considered that because the process of Wygnanski et al. ('224) improves mixing, it is intrinsically capable of improving heat exchange.

### ***Response to Arguments***

43. Applicant arguments have been fully considered by are found unpersuasive. The applicant has not addressed any particular claim or pointed out differences between the positively recited steps as claimed and Wygnanski ('224). Applicant states that the instant invention is different from Wygnanski ('224) because it is based on a newly discovered mechanism, while Wygnanski ('224) is base on the Kelvin-Helmholtz mechanism. However, the instant invention must be distinguished from the prior art by positively reciting, active steps in the claims to be allowed.

### ***Conclusion***

44. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

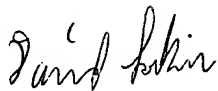
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Sorkin whose telephone number is 703-308-1121. The examiner can normally be reached on 7:30 - 5:00 Mon.-Thur., Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7718 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



David Sorkin

August 2, 2000

  
MATTHEW O. SAVAGE  
PRIMARY EXAMINER  
GROUP 1300